ASSIGNMENT 2

Textbook Assignment: "Photographic Quality Assurance." Pages 2-5 through 2-29.

Learning Objective: Identify the principles of sensitometry.

2-1. For which, if any, of the following reasons are sensitometers used to expose light-sensitive materials in a QA program?

1. They are easier to operate in complete darkness than a 35mm camera
2. They provide a known quantity and quality of light
3. They provide exact density readings
4. None of the above

2-2. In studying the characteristics of a light-sensitive material, you should use what instrument to make a series of graded exposures on the material being tested?

1. Densitometer
2. Sensitometer
3. Exposure meter
4. Wedge spectrograph

2-3. To determine the response characteristics of an emulsion under conditions that simulate actual photography, the light source of your sensitometer must meet which of the following conditions?

1. The color temperature of the light must be equivalent to that of the light used in practical photography
2. The time of exposure must be accurately controlled
3. The intensity of light must be known
4. All of the above

2-4. What is the approximate color temperature of an incandescent light source in a sensitometer?

1. 2400 K
2. 3200 K
3. 5400 K
4. 7000 K

2-5. What is the approximate color temperature of sunlight?

1. 2400 K
2. 3200 K
3. 5400 K
4. 7000 K

2-6. What is the purpose of the step tablet in a sensitometer?

1. It is used to produce a logarithmically graded series of exposures
2. It allows you to stack strips of film without damaging them
3. It controls the amount of voltage supplied to the light source
4. It lists the procedural steps for producing a sensitometric strip

2-7. What is the density difference between each step on an 11-step step tablet?

1. 1.00
2. 0.11
3. 0.15
4. 0.30

2-8. On a 21-step step tablet, there is a difference of what number of f/stops between each step?

1. 1
2. 2
3. l/2
4. l/3

2-9. You are preparing to process a control strip through a roller-transport processor. You should feed the control strip into the processor in what manner?

1. Low-density end first
2. High-density end first
3. It does not matter which end is fed first

2-10. You are using a sensitometer with a light source that supplies an exposure of 501 lux/seconds and a 21-step step tablet. The film step with the highest density receives what amount of exposure?

1. 4.80 log/lux seconds
2. 2.70 log/lux seconds
3. 2.65 log/lux seconds
4. 2.10 log/lux seconds

Learning Objective: Recognize steps used to plot characteristic curves.

2-11. What does the vertical axis represent on a characteristic curve?

1. Exposure
2. Gamma
3. Density
4. Contrast

2-12. What does the horizontal axis represent on a characteristic curve?

1. Exposure
2. Gamma
3. Density
4. Contrast

2-13. On a characteristic curve, an increase of exposure is indicated in what relationship?

1. From left to right
2. From right to left
3. From top to bottom
4. From bottom to top

2-14. What instrument is used to read the steps on a sensitometric strip?

1. Sensitometer
2. Wedge spectrograph
3. Exposure meter
4. Densitometer

2-15. At what location on a characteristic curve is step 1 of a sensi-strip plotted?

1. The lower right-hand corner
2. The lower left-hand corner
3. The upper right-hand corner
4. The upper left-hand corner

2-16. A characteristic curve that is drawn properly should have what appearance?

1. Straight lines connected to each plotted point
2. Very apparent angles
3. A single, smooth-flowing line
4. All points connected by curved lines

2-17. What type of information should you include on the graph of a characteristic curve?

1. The film type only
2. The developer type only
3. The processing temperature only
4. All of the above

Learning Objective: Identify information that can be derived from a characteristic curve.

2-18. Which of the following factors may be derived from an analysis of a characteristic curve?

1. Contrast
2. Effective speed
3. Useful exposure range
4. All of the above

● IN ANSWERING QUESTIONS 2-19 THROUGH 2-22, REFER TO THE FOLDOUT, FIGURE 2-6, AT THE BACK OF CHAPTER 2.

2-19. What is the lowest density recorded on the graph?

1. 1.00
2. 0.16
3. 0.10
4. 0.05

2-20. What is the highest density recorded on the graph?

1. 1.84
2. 2.10
3. 3.00
4. 4.50

2-21. What is the density at step ll?

1. 1.50
2. 1.19
3. 0.66
4. 0.40

2-22. What step(s) on the graph indicate(s) gross fog?

1. 1 only
2. 1 and 2 only
3. 3 and 4 only
4. 1, 2, 3, and 4

2-23. What section of a characteristic curve represents the shadow areas of a subject?

1. Toe
2. Straight line
3. Shoulder
4. Slope

2-24. What point on a characteristic curve indicates the least amount of exposure and produces a noticeable change in density?

1. The speed point
2. The inertia point
3. The threshold
4. The minimum useful density

2-25. What section has the greatest slope or gradient on a characteristic curve?

1. Toe
2. Straight line
3. Shoulder
4. Threshold

2-26. On a characteristic curve, what section indicates an equal change in density for an equal increase in exposure?

1. Toe
2. Straight line
3. Shoulder
4. Threshold

2-27. The bright, highlight tones of a subject are indicated on what portion of a characteristic curve?

1. Toe
2. Straight line
3. Shoulder
4. Threshold

2-28. At what section of a characteristic curve does the density decrease when there is an increase in exposure?

1. Toe
2. Straight line
3. Shoulder
4. Threshold

2-29. The range of exposures covered by the straight-line section of a characteristic curve is known by what term?

1. Emulsion latitude
2. Exposure latitude
3. Useful exposure range
4. Total exposure scale

2-30. As the contrast of a film increases, the emulsion latitude

1. increases
2. decreases
3. remains the same

2-31. You are determining the useful exposure range of a ground-pictorial film. What sections of a characteristic curve should you consider when making this determination?

1. Toe section only
2. Straight-line section only
3. Shoulder section only
4. Toe, straight-line, and shoulder section

2-32. For ground-pictorial film, the minimum useful density is at what point on a characteristic curve?

1. Gross fog
2. 0.10 above gross fog
3. 0.30 above gross fog
4. 90 percent of the maximum density

2-33. What term describes the margin of exposure error?

1. Exposure latitude
2. Speed point
3. Gamma infinity
4. Exposure range

2-34. Which of the following film and subject combinations provide the greatest exposure latitude?

1. Kodalith Ortho and a block diagram
2. Kodachrome 25 and a landscape scene
3. Kodacolor Gold 400 and a foggy seascape
4.

2-35. A film with which of the following IS0 speeds has the greatest exposure latitude?

1. 50
2. 100
3. 200
4. 400

Learning Objective: Demonstrate understanding of gamma and the way it is calculated.

2-36. The slope or gradient of the straight-line portion of a characteristic curve is determined by the relationship between a given log H interval and which of the following factors?

1. Useful exposure scale
2. Emulsion latitude
3. Total density range
4. Corresponding density difference

2-37. What range of gamma is desirable for negatives used to record ground-pictorial subjects?

1. 1.00 to 1.50
2. 1.20 to 2.40
3. 0.65 to 0.90
4. 0.60 to 2.40

2-38. What gamma provides an equal change of densities for an equal change of exposures in the straight-line section of a characteristic curve?

1. 1.00
2. 2.00
3. 0.30
4. 0.50

2-39. Which of the following symbols is used to indicate change or difference?

1. Alpha
2. Beta
3. Delta
4. Gamma

2-40. Determine the gamma of a negative using the following information. $H_1 \cdot H_2$ is equal to 2.00 and $D_1 \cdot D_2$ is equal to 1.00.

1. 1.00
2. 2.00
3. 3.00
4. 0.50

2-41. You are determining the gamma of a characteristic curve. ΔD is 0.65 and ΔH is 0.95. What is the gamma?

1. 1.00
2. 1.46
3. 0.68
4. 0.39

Learning Objective: Identify factors that affect the contrast of light-sensitive materials.

2-42. A negative may contain which of the following types of contrast?

1. Midtone
2. Highlight
3. Shadow
4. Each of the above

2-43. Other than personal preference, you should use what factor to determine the contrast-printing filter with which a black-and-white negative will print best?

1. Gamma
2. Contrast index
3. Total negative contrast
4. Emulsion latitude

2-44. You have processed several rolls of the same type of black-and-white negative film to the same gamma. After inspecting the negatives, you determine that all the negatives were exposed correctly. Therefore, you can assume that all of the negatives can be printed using the same contrast-printing filter.

1. True
2. False

2-45. Gamma can be considered as the ratio between what factors?

1. Scene brightness range and negative density
2. Scene contrast and negative contrast
3. Scene contrast and negative density
4. The shoulder and the toe of a characteristic curve

2-46. When film exposures extend into the toe section of the D-log H curve, what measurement should you use to measure the effects of exposure and development?

1. Contrast index
2. Gamma
3. pH
4. Specific gravity

2-47. You are taking aerial photographs of a ship that is under suspicion of transporting weapons illegally. What section of a characteristic curve should place the shadow areas of this subject?

1. Toe
2. Straight line
3. Shoulder

2-48. Which of the following contrast measurements does NOT take shadow and highlight densities into account?

1. Gamma
2. Contrast index
3. Total density range
4. Each of the above

2-49. Which of the following statements regarding gamma and contrast-index values of photographic materials is incorrect?

1. They are fixed values
2. They are not fixed values
3. The values fluctuate according to the developer being used
4. The values change according to the method of processing being used

2-50. With all other factors constant, a change in which of the following areas influences gamma or contrast index the greatest?

1. Exposure
2. Latitude
3. Light intensity
4. Development

2-51. Which of the following terms describes the point when gamma reaches its maximum level?

1. Gamma infinity
2. Gamma burnout
3. Gamma climax
4. Gamma reciprocation

2-52. Ground-pictorial film should be processed to which of the following contrast-index values?

1. 0.30
2. 0.58
3. 0.65
4. 0.90

IN ANSWERING QUESTION 2-53, REFER TO FIGURE 2-10.

2-53. To obtain a gamma of 0.60, you should process this film for what length of time?

1. 3 l/4 minutes
2. 3 l/2 minutes
3. 5 minutes
4. 4 minutes

Learning Objective: Identify the importance of a chemical quality assurance program.

2-54. Which of the following practices is probably the most important factor in a successful chemical quality assurance program?

1. Use extremely accurate modern scientific measuring devices
2. Take chemical samples and verify their properties on a daily basis
3. Keep equipment and work areas clean
4. Directly supervise the preparation of all photographic solutions

2-55. What is/are the proper method(s) for determining whether solutions are suitable for processing photographic images?

1. Check them for discoloration
2. Check them for sedimentation
3. Check them by chemical analysis
4. Each of the above

2-56. Before sampling a large batch of newly mixed developer, you should wait what minimum time before performing chemical analysis?

1. 5 minutes
2. 10 minutes
3. 30 minutes
4. 2 hours

2-57. You are drawing a chemical sample with a pipet from a color film processor. You should draw this sample from what depth of the tank?

1. As close to the surface as possible
2. About 1 inch below the surface
3. About 5 inches below the surface
4. From the bottom of the tank

2-58. You have drawn a solution sample to be analyzed, Before taking a pH measurement, you should shake the sample vigorously.

1. True
2. False

2-59. You should perform which of the following procedures before using a freshly mixed developer?

1. Complete chemical analysis
2. pH testing
3. Specific-gravity check
4. Both 2 and 3 above

2-60. When you take a pH measurement of a solution, the temperature of the solution is most critical when the pH is at which of the following values?

1. 10.00
2. 8.00
3. 7.00
4. 6.00

2-61. When multiple samples of the same solution are tested, you should standardize a pH meter at which of the following times?

1. Before every reading
2. After 15 minutes has elapsed only
3. After four readings only
4. After 15 minutes has elapsed or after four readings

2-62. You have taken a pH reading of four samples of the same developer solution. The readings were 9.38, 9.41, 9.47, and 9.71. What pH value should you record on the control chart?

1. 9.38
2. 9.41
3. 9.49
4. 9.71

2-63. You could use a specific gravity reading to verify which of the following chemical properties?

1. Dilution
2. Activity
3. Contamination
4. Shelf life

2-64. You have just plotted the gamma from a control strip and the plot exceeds the upper-control limit. Which of the following factors may have caused this condition?

1. Over-replenishment
2. Excessive agitation
3. Developer temperature too high
4. Each of the above

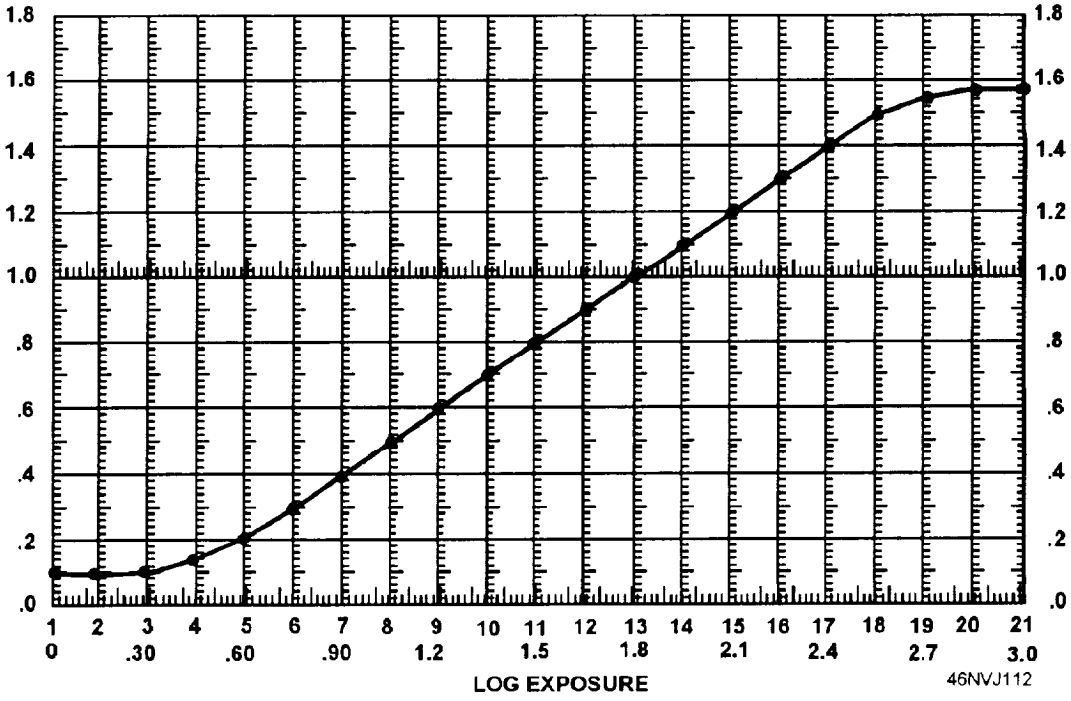

FIGURE 2A

IN ANSWERING QUESTIONS 2-65 AND 2-66, REFER TO FIGURE 2A.

Learning Objective: Identify characteristics of a D log-H curve.

2-65. What step best represents the speed point for ground-pictorial film?

1. 5
2. 11
3. 3
4. 18

2-66. What step best represents the speed point for an aerial film?

1. 1
2. 7
3. 5
4. 4

FIGURE 2B

IN ANSWERING QUESTION 2-67, REFER TO FIGURE 2B.

2-67. From what area of the control strip should you take a reading for gross fog?

1. A
2. B
3. c
4. D

Learning Objective: Recognize factors that may affect a process-control chart. (This objective is continued in assignment 3.)

2-68. Which of the following factors affect(s) gross fog?

1. Development
2. Age
3. Base thickness
4. All of the above

2-69. A process appears to be out of control but may not be. What is this situation called?

1. Variability
2. Deviation
3. Alpha risk
4. Beta risk

2-70. A process appears to be in control but may not be. What is this situation called?

1. Variability
2. Beta risk
3. Alpha risk
4. Deviation

2-71. What five process conditions can a control chart show?

1. Population, variability, deviation, standard error, and standard
2. Contrast index, high density, low density, speed point, and gamma
3. Jump, run, trend, out of control, and normal pattern
4. Gross fog, pH, temperature, fpm, and contrast